AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1-19 (Cancelled).

20. (New) A method for cost determination independent of data packet forwarding in a multihop communications network, **characterized by** the steps of:

determining a plurality of simultaneously potential next hop nodes for at least one of multiple nodes from a source node to a destination node in the network, such that said simultaneously potential nodes jointly optimize a predetermined cost function, said plurality of simultaneously potential next hop nodes form a subset of the neighboring nodes to said at least one of multiple nodes; and

determining the optimal cost for said at least one of multiple nodes to be equal to the optimized value of the predetermined cost function, wherein said optimal cost is dependent of a respective cost for each of said plurality of simultaneously potential next hop nodes

21. (New) The method according to claim 20, **characterized by** optimizing said predetermined cost function based at least partly on an individual cost for each possible next hop node for said at least one multiple nodes.

22. (New) The method according to claim 20, **characterized by** optimizing said predetermined cost function based at least partly on a cost factor due to said at least one of multiple nodes.

23. (New) The method according to claim 20, **characterized by** determining a plurality of simultaneously potential next hop nodes and an associated optimal cost node by node, until a mesh of simultaneously potential routes is provided from the source node to the destination node.

24. (New) The method according to claim 20, **characterized by** determining link parameters that together with the plurality of simultaneously potential next hop nodes jointly optimizes a predetermined cost function.

25. (New) The method according to claim 20, **characterized by** determining the plurality of simultaneously potential next hop nodes for a node *i* based on optimization of a predetermined cost function f_1 according to:

$$\underset{S_j^{''} \in S''}{Optimize}\ f_1\left(Cost_{S_{j(k)}^{''}}, \Delta Cost_{i,S_{j(k)}^{''}} \middle| \forall S_{j(k)}^{''} \in S_j^{''}\right) \Rightarrow Cost_i(opt), S_j^{''}(opt)$$

where S" represents all possible next hop nodes for node *i*, $S_j^{''}$ represents all possible combinations of the nodes in *S"*, $Cost_{S_{j(k)}^{''}}$ is the individual cost of node $S_{j(k)}^{''}$ in one particular set $S_j^{''}$, and $\Delta Cost_{i,S_{j(k)}^{''}}$ is the cost of going from node *i* to node $S_{j(k)}^{''}$, and *$Cost_i$ (opt)* is the optimum cost for node *i* and $S_j^{''}(opt)$ is the set of simultaneously potential next hop nodes.

26. (New) The method according to claim 25, **characterized by** determining the plurality of simultaneously potential next hop nodes for node *i* based on optimization of a predetermined cost function according to:

$$\underset{S_j''\in S''}{Optimize}(\ f_1\left(Cost_{S_{j(k)}''},\Delta Cost_{i,S_{j(k)}''}\middle|\forall S_{j(k)}''\in S_j''\right))\circ Const_i \Rightarrow Cost_i,S_j''(opt),$$

where $\circ$ is an arbitrary arithmetic operation depending on choice and design goal, and $Const_i$ is a term which node *i* may include in the cost.

27. (New) The method according to claim 26, **characterized by** determining the plurality of simultaneously potential next hop nodes for a node *i* based on optimization of a predetermined cost function according to:

$$Cost_i = \underset{S_j''\in S''}{Optimize}\left\{\underset{Par}{Optimize}\left\{Cost_{i,S_j''}(Par)\circ f_2\left(Cost_{S_{j(k)}''}\middle|\forall S_{j(k)}''\in S_j''\right)\right\}\right\}\circ Const_i$$

$$\Rightarrow Cost_i(opt),S_j''(opt),Par(opt)$$

where *Par* is an n-dimensional link parameter space, where *n=1, 2,...,* $Cost_{i,S_j''}(Par)$ represents the cost to send data from node i to a node in the set S_j'' as a function of the

link parameter space *Par* and the set of nodes S_j'', and *Par(opt)* is the optimum set of link parameters for forwarding data.

28. (New) The method according to claim 26, **characterized by** selecting the term $Const_i$ depending on topology connectivity and/or dynamic properties of the network.

29. (New) The method according to claim 26, **characterized by** selecting the term $Const_i$ depending on stochastic variables.

30. (New) The method according to claim 26, **characterized by** selecting the term $Const_i$ depending on at least one of interference, battery status at node *i* and a queuing situation at said node *i*.

31. (New) The method according to claim 20, **characterized by** associating the cost for a node with at least one of delay, interference, number of hops and path loss.

32. (New) A method for cost optimization independent of data packet forwarding in a routing protocol in a communications network, **characterized by** optimizing a predetermined cost function, whereby an optimal cost and a plurality of simultaneously potential next hop nodes are determined for at least one of multiple nodes from a source node to a destination node, wherein said optimal cost is dependent of a respective cost for each of said plurality of simultaneously potential next hop nodes, and said plurality of

simultaneously potential next hop nodes form a subset of the neighboring nodes to said at least one of multiple nodes.

33. (New) A system for cost determination independent of data packet forwarding in a multihop communications network, **characterized by**:

means for determining a plurality of simultaneously potential next hop nodes for at least one of multiple nodes from a source node to a destination node in the network such that said nodes jointly optimize a predetermined cost function, said plurality of simultaneously potential next hop nodes form a subset of the neighboring nodes to said at least one of multiple nodes; and

means for determining an optimal cost, for said at least one of multiple nodes, to be equal to the optimized value of the predetermined cost function, wherein said optimal cost is dependent of a respective cost for each of said plurality of simultaneously potential next hop nodes.

34. (New) The system according to claim 33, **characterized by** said determining means being adapted to optimize said predetermined cost function based at least partly on an individual cost for each possible next hop node for said at least one of multiple nodes..

35. (New) The system according to claim 33, **characterized by** means adapted to determine a plurality of simultaneously potential next hop nodes an associated optimal cost node by node, until a mesh of simultaneously potential routes is provided from the source node to the destination node.

36. (New) The system according to claim 33, **characterized by** means adapted to determine link parameters that together with the plurality of simultaneously potential next hop nodes jointly optimize a predetermined cost function.

37. (New) The system according to claim 33, **characterized by** said determining means being adapted to optimize a predetermined cost function f_1 according to:

$$\underset{S_j^{''} \in S''}{Optimize}\ f_1\left(Cost_{S_{j(k)}^{''}}, \Delta Cost_{i,S_{j(k)}^{''}} \middle| \forall S_{j(k)}^{''} \in S_j^{''}\right) \Rightarrow Cost_i(opt), S_j^{''}(opt)$$

where S'' represents all possible next hop nodes for node i, $S_j^{''}$ represents all possible combinations of the nodes in S'', $Cost_{S_{j(k)}^{''}}$ is the individual cost of node $S_{j(k)}^{''}$ in one particular set $S_j^{''}$, and $\Delta Cost_{i,S_{j(k)}^{''}}$ is the cost of going from node i to node $S_{j(k)}^{''}$, and $Cost_i(opt)$ is the optimum cost for node i and $S_j^{''}(opt)$ is the set of simultaneously potential next hop nodes.

38. (New) A node enabling cost determination independent of data packet forwarding in a multihop communications network, **characterized by**

means for determining a plurality of simultaneously potential next hop nodes for said node, such that said simultaneously potential next hop nodes jointly optimize a

predetermined cost function, said plurality of simultaneously potential next hop nodes form a subset of the neighboring nodes to said at least one of multiple nodes; and

means for determining an optimal cost for the node to be equal to the optimized value of the predetermined cost function, wherein said optimal cost is dependent of a respective cost for each of said plurality of simultaneously potential next hop nodes.